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GROUP 144  
CLASS 8  
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Hydrophilising treatment for hydrophobic fibres and textiles - by impregnating with a hydrophilic additive, a polyfunctional reactant and a nitrogenous catalyst, and heating

Fibrous materials such as textile fabrics are treated with a hydrophilic additive (I), a polyfunctional reactant (II) and a nitrogenous catalyst (III), and heating the material to cause reaction between the (I) and (II).

(I) is (a) a cpd. with  $> 2$  ether gps. and  $> 2$  OH gps. per mol. and/or (b) cpd. with divalent-NHCO- gp(s) and one or more OH gps per mol. and/or (c) cpd. with  $> 2$  -CH(OH)-gps. and one or more additional OH gp. per mol. The polyfunctional additive (II) has  $> 2$  epoxide gps. and/or isocyanate gps. per mol. The catalyst (III) is pref. a tert. amine, aminoacids, caprolactam, or mixts.

## USE/ADVANTAGE

The process is esp. useful for the treatment of polyethylene terephthalate fibres and textiles to render them wettable by water and to improve the antistatic properties. The process does not cause deterioration in fibre strength and is more efficient than known fibre grafting treatments using high energy radiation. The treatments are durable and do not cause discolouration of the textile during subsequent pro-

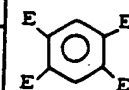
A(8-S4, 8-S5, 10-E1, 12-G, 12-S5S, 12-S5T)

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cessing.

## MATERIALS

Pref. (I) include cpds. of formula



in which two gps. E = E<sub>1</sub> and two gps. E = E<sub>2</sub>, such that (i) E<sub>1</sub> = -CON(R<sub>1</sub>)<sub>2</sub> or -CO<sub>2</sub>R<sub>1</sub>;

$$R_1 = \left[ (CH_2)_{P_1} - \underset{T_2}{(CH)}_{P_2} - (CH_2)_{P_3} - O \right]_m - T_1; m = 0-10; P_1, P_2$$

and P<sub>3</sub> = 0 or 1; T<sub>2</sub> = H or OH, T<sub>1</sub> or OT<sub>1</sub>; and

$$T_1 = \left[ (CH_2)_{P_4} - CH - (CH_2)_{P_5} - O \right]_{m'} - A_1, \text{ where } m' = 0-10, P_4$$

and P<sub>5</sub> = 0 or 1; A<sub>1</sub> = 1-3C alkyl gp.; A<sub>2</sub> = -X or -OX; X = H or 1-3C alkyl; and (ii) E<sub>2</sub> = -CO<sub>2</sub>H or -CO<sub>2</sub>(CH<sub>2</sub>)<sub>x</sub>(CHOH)<sub>x</sub>CH<sub>2</sub>Q; x<sub>1</sub> and x<sub>2</sub> = 0 or 1 and Q = H or OH; such that P<sub>1</sub>+P<sub>2</sub>+P<sub>3</sub>  $> 2$ ; P<sub>4</sub>+P<sub>5</sub>  $> 1$ ;  $\sum m > 2$ ; if Q = OH, x<sub>1</sub> and x<sub>2</sub> = 1; and  $> 1$  gp. E = OH.

Typical polyfunctional additives (II) are

E(7-A3, 10-A14, 10-C2C, 10-C3, 10-C4C, 10-D3, 10-E2, 10-E4) F(3-C5, 3-C).

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using tribenzylamine as catalyst, and curing for 10 mins. at 160°C, the fabric had a charge loss time of 810 sec., a wetting time of 7 sec. and a wicking height of 3.0 inch. (56pp513).

1,2,4-C<sub>6</sub>H<sub>3</sub>(CO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-A-CH<sub>2</sub>CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-O-CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-O-CH<sub>2</sub>CH<sub>2</sub>-C(CH<sub>3</sub>)<sub>2</sub>-C<sub>6</sub>H<sub>4</sub>-O- or di- or trifunctional isocyanates.

The (I) and (II) are applied to the fabric from an organic medium, pre- in a ratio of 2:1 to 1:3, together with 0.1-5 mol % (on I+II) of the catalyst. The fabric is treated until the reactants have been absorbed into the fibres, which is usually for 1 sec. - 1 hour (5 sec. - 10 mins.) at 10-60°C (15-40°C). The treated fabric is then heat treated e.g. for 5 sec. to 240 mins. at 90-230°C to cause reaction between the (I) and (II).

**EXAMPLE**

Tabular information is presented showing the antistatic properties, wetting time and wicking height of woven 'Dacron' (R TM) fabrics treated with various combinations of I/II/III. Thus the untreated fabric had a charge loss time of > 1800 sec., a wetting time of > 360 sec. and a wicking height of 1.2 inch. After treatment with a compn. congt. (I), E<sub>1</sub> = -CO<sub>2</sub>(CH<sub>2</sub>CH<sub>2</sub>O)<sub>2</sub>CH<sub>2</sub> and E<sub>2</sub> = -CO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH (II) a reactant CH<sub>2</sub>-CHCH<sub>2</sub>-OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-O-CH<sub>2</sub>-CH<sub>2</sub>.

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Bezeichnung:

Verfahren zur Behandlung eines Fasergegenstandes

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⑦4

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